

Preface

This issue of the *IBM Systems Journal* includes papers on three themes: the IBM RT Personal Computer, Advanced Peer-to-Peer Networking, and box-structured information systems. These subjects span interests ranging from intelligent workstations, through departmental and small business systems, to advanced methodologies for defining complex information systems.

The IBM RT Personal Computer has combined a number of exciting technical developments and innovations in IBM workstation hardware and software. Beyond the readily evident enhanced processor speed and memory capabilities, hardware support may be found for virtual memory, including memory-mapped files. These features are advanced capabilities for workstations of this size. The AIX system, built on a UNIX® System V base, has melded together a wide range of technical enhancements for both usability and productivity support. Together, the hardware and software implementations provide an extensible platform for continuing evolution. The system is supported by a Virtual Resource Manager (VRM) which provides a high degree of transparency to the software for changes made in the hardware configuration.

The paper on AIX by Loucks and Sauer provides insight on the technical decision processes by which a UNIX-based system was selected and areas identified for replacement and enhancement in order to best utilize the new hardware. The authors describe the general capabilities and functions of each of the operating-system components, together with changes that were implemented for the RT Personal Computer. The paper provides a general perspective for those who are new to UNIX systems, as well as those who already have familiarity with UNIX implementations.

The Reduced Instruction Set Computer (RISC) architecture of the IBM RT processor and the memory

management hardware that supports virtual storage, are the significant features of the RT PC. The history and architecture of each unit are described in the paper by Simpson and Hester. The implementation provides high speed and large memory addressability in a system that can be optimally programmed almost entirely in high-level languages.

UNIX-based operating systems provide a distinctive environment for developing applications. The paper by Cordell, Misra, and Wolfe discusses the program development tools, environment and application programming design considerations available in AIX. Their presentation includes discussion of the process model, data model, user interface, and terminal support capabilities included in AIX.

The UNIX user interface was originally designed for use by computer science professionals from typewriter-like terminals. Creating a user interface that would be appropriate for a wider range of user experience and interest levels on display terminals presented a particularly challenging opportunity. The paper by Waters, Bias, and Smith-Kerker serves both to describe the numerous enhancements implemented to make AIX a more usable system, and to present the authors' assessment of the organizational issues and arrangements that made this project particularly successful.

The paper by Mills, Linger, and Hevner describes a significant contribution to the methodologies of structuring information systems. By dividing and organizing information systems into a hierarchy of three distinct forms, a design can be achieved that allows the application of four principles considered essential to system development. The paper describes these principles and discusses a progression of activities, represented in the form of a system development spiral, that aid in managing the development process.

Small and intermediate systems have grown steadily in popularity for use as departmental systems. These systems may be remotely located as often as they are co-located at one establishment. Varying needs for interconnection of these systems present requirements widely different from those of the traditional central mainframe interactive and distributed processing models. The paper by Green et al. provides a perspective on the solution provided by IBM's Advanced Peer-to-Peer Networking (APPN) offering. The authors present the history of these types of systems, a comprehensive analysis of user requirements that preceded development, and an overview of the product design. APPN provides a rich set of

connectivity options supporting a range of facilities that include terminal pass-through, file transfer, and distributed data management.

The paper by Sultan et al. offers a comprehensive look at the implementation of APPN. Their discussion includes the design of APPN, implementation issues, storage management, route selection, and directory services. The resulting product offers small- and intermediate-system users a fine combination of connectivity function, performance, and ease of use.

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Editor

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